

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

2526-4
JG 971 U.S. PAT. OFF.
10/05/242
01/18/02



IN RE APPLICATION OF:)
BRIAN H. JONES)
SERIAL NO.:)
FILED: CONTEMPORaneously HEREWITH) GROUP ART UNIT NO.
TITLE: LOW WEIGHT HIGH)
PERFORMANCE COMPOSITE)
VESSEL AND METHOD OF)
MAKING SAME)
EXAMINER:)

INFORMATION DISCLOSURE STATEMENT

UNDER 37 C.F.R. 1.97

Commissioner of Patents
and Trademarks
Washington, D.C. 20231

Sir:

The applicant in the above-identified U.S. patent application is advising the U.S. Patent and Trademark Office of the following references known to the applicant at the time of filing an application therefor, and which may have some relevance to the subject matter taught or claimed in this application. These references include the following U.S. Patents:

<u>Patent No.</u>	<u>Patentee</u>	<u>Date</u>
5,655,299	Lindahl	8/12/97
5,865,923	Johnson	2/2/99
6,022,435	Palazzo	2/8/00

5,217,140	Lindahl	6/8/93
1,966,241	Furrer	7/10/34
5,427,334	Rauscher, Jr.	6/27/95
5,054,645	Sharp	8/8/91
5,822,838	Seal, et al	10/20/98
6,145,692	Cherevatsky	11/14/00
4,780,947	Palazzo	11/1/88
3,066,822	Watter	12/4/62
4,596,619	Marks	6/24/86
5,376,200	Hall	12/27/94
5,651,474	Callaghan, et al	7/29/97
5,556,601	Huvey	9/17/96
5,871,117	Protasov, et al	2/16/99
6,102,241	Palazzo	8/15/00
3,811,173	Baumann	5/21/74
6,138,861	Palazzo	10/31/00

1) Furrer 1,966,241: The Furrer '241 patent discloses a pressure tank for containment of gas and which is constructed with two semi-hemispherical shells, joined together by a separately formed ring such as the ring 5 which is also metal, as best shown in Figure 2 of the Furrer patent. However, the entire tank is formed of metal and the backing ring 5 in Furrer is welded to the two semi-hemispherical shelves.

2) Lindahl 5,217,140: The Lindahl '140 patent discloses a pair of cylindrically shaped tank halves which are secured

together, as best shown in Figures 2, 3, 4 and 5 thereof. The Lindahl '140 patent is vague as to the particular connection between the two shell halves, as made, but it nevertheless discloses the use of two shell halves which are connected together. Lindahl '140 also teaches the use of rotationally casting an inner shell on the inside of the outer shell. The outer shell thereby serves as a mold for the inner shell.

3) Lindahl 5,655,299: The Lindahl '299 patent is primarily concerned with fabricating a tank connector assembly. In Figures 9-11 of Lindahl '299, the patentee does disclose a pair of tank halves which are again secured together. This reference also discloses the use of an outer shell of a metallic material and an inner shell of a polymeric material.

4) Rauscher, Jr. 5,427,334: The Rauscher, Jr., '334 patent discloses a method of making a storage tank using a dissolvable hardenable liquid injected into a mold. The mold is removed thereby leaving a soluble mandrel in the shape of the cavity of the tank. A composite reinforcing shell is then applied as for example, by filament winding, over the liner which was then formed. Solvent can be used to remove the inner shell after formation of the outer shell. Although Rauscher, Jr., '334 does not disclose a pair of tank halves which are brought together with a ring, it does nevertheless disclose the location of the tank components which are installed in the interior cavity of the shell.

5) Watter 3,066,822: The Watter '822 patent discloses a composite missile structure having a non-metallic outer shield and

a metallic inner core. The core of the missile is corrugated with corrugations circumfentially disposed about the core and having head ends. It appears as though the ends can be welded to the central cylindrically shaped portion.

6) Cherevatsky 6,145,692: The Cherevatsky '692 patent discloses a pressure vessel with an inner metallic liner. Cherevatsky '692 is primarily concerned with the formation of the outer shell and the inner liner but does not disclose the use of shell sections which are brought together and secured together.

7) Palazzo 4,780,947: The Palazzo '947 patent discloses a double wall tank, which has a single inner wall and with a hardenable synthetic resin material formed on the exterior surface of that inner wall, which is used to form a spacer material having one or more channels. A film is stretched across the spacer material. Finally, a liquid-type rigid outer sheeting material is applied over this structure.

8) Palazzo 6,138,861: The Palazzo '861 patent discloses a storage tank for the storage of liquids having multiple walls. A single wall inner tank having a very large aperture is initially provided, and an outer sheath is placed over this single wall inner tank. A synthetic resin material is applied to the exterior surface to thereby provide a spacer and an outer sheath is then applied. Access to the interior is provided by a rather enlarged opening such as the opening 28 in Palazzo '861.

9) Baumann 3,811,173: The Baumann '173 patent is related to a method for manufacture of liquid carrying tanks, having inner

stabilizers or baffles. The tank is formed of an outer metallic shell and a plastic inner wall. Moreover, the tank is made by securing two semi-cylindrically shaped shells together, as best shown in Figures 1 and 2 of Baumann '173. The outer wall is formed of a metallic material and the inner wall is formed of a plastic material with a core of plastic foam.

10) Protasov, et al., 5,871,117: The Protasov et al. '117 patent discloses a pressure vessel in the form of a cylindrically shaped tubular body having a lattice-type framework on the interior thereof.

11) Palazzo 6,102,241: The Palazzo '241 patent discloses a cylindrical storage tank having a first tank section formed of a cylindrical side wall with one closed end and with an initially open end. Palazzo '241 discloses a cylindrical side wall formed by helically extruding individual overlapping layers of a synthetic resin on a manifold or form. Thereafter, the open end can be closed. The end portions are formed and fixed by sealing to the side wall. Palazzo '241 discloses the filament winding technique used in forming the cylindrically shaped side wall of the shell.

12) Sharp 5,054,645: The Sharp '645 patent discloses a storage tank system with an in-situ formed inner liner. The double walled sandwich structure forming the tank is more fully illustrated in Figure 1 of Sharp '645. A plurality of holes are formed in the inner layer to act as molds for formation of the inner wall. The layers forming the outer wall or shell and inner wall or shell of the tank are separated from one another.

13) Palazzo 6,022,435: The Palazzo '435 patent discloses the formation of an inner tank wall on a mandrel. This inner wall is then over wrapped by fiber reinforcing material to form a multi-ply tank wall. A layer of synthetic resin is applied providing a spacing means for a free passage of liquids. An outer sheath is then bound to the resin material. Again, Palazzo '435 also discloses a large opening for access to the interior thereof.

14) Johnson 5,865,923: The Johnson '923 patent discloses an initial shell with an interior chamber and a second chamber formed by an extension of that shell. Attention is invited to Figures 1 and 2 of the Johnson patent which discloses this structure. No joinder ring is used to secure the two sections together.

15) Callaghan, et al., 5,651,474: The Callaghan et al. '474 patent discloses a tank for the containment of cryogenic materials and the tank is formed of a plastic composite material using essentially no metals. There is no liner in the Callaghan et al. '474 structure. A reinforced plastic fiber composite is used to form the tank having three individual lobes which are then joined together and supported by woven longerons. This structure is best illustrated in Figure 2 of the Callaghan et al. '474 patent.

16) Huvey, et al., 5,556,601: The Huvey et al. '601 patent discloses a low weight tank which presumably is used for outer space environments. The tank is of somewhat of a different construction, compared to most prior art tanks, having two bottoms separated by a corrugated section extending circumferentially around the outer wall of the tank. Longitudinal reinforcements also

extend throughout the tank.

17) Marks 4,596,619: The Mark '619 patent discloses a method of making a composite vessel by using an elastomeric ribbon applied to a mandrel. The ribbon is employed to tack together internal segments. A shell of a reinforced plastic composite material is then applied to this elastomeric ribbon.

18) Hall 5,376,200: The Hall '200 patent discloses a fiber reinforced plastic tank. The method of producing the tank uses integral connections between fittings during the actual manufacture of the tank. Composite fittings are then attached to the ends of the tank thus formed.

19) Seal, et al. 5,822,838: The Seal et al. '838 patent discloses a composite overwrapped pressure vessel using a thin liner made from a material having a high modulus of elasticity. A composite overwrap is applied to this inner layer and a high performance film adhesive is applied to the overwrap liner construction. The composite overwrap is filament wound onto the titanium liner and the overwrap and the liner are cured together.

Copies of the foregoing references are enclosed herewith.

Please charge any costs in connection with submittal of this statement to Deposit Account No. 19-0258.

Dated: Dec. 17, 2001

Respectfully submitted,


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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: COMMISSIONER OF PATENTS AND TRADEMARKS, ARLINGTON, VIRGINIA 22202 on Dec. 19, 2001.



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LIST OF INFORMATION CITED BY APPLICANT PTO 1449		DOCKET:	SERIAL NO.:	GROUP:
APPLICANT: Brian H. Jones		FILING DATE:	EXAMINER:	

U.S. PATENT DOCUMENTS

Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date
	AA	5,655,299	8/22/97	Lindahl			
	AB	5,865,923	2/2/99	Johnson			
	AC	6,022,435	2/8/00	Palazzo			
	AD	5,217,140	6/8/93	Lindahl			
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	AJ	4,780,987	11/1/88	Palazzo			
	AK	3,066,822	12/4/62	Watter			

FOREIGN PATENT DOCUMENTS

		Document Number	Date	Country	Class	Subclass	Translation Yes No
	AL						
	AM						
	AN						
	AO						
	AP						

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	AD 5,556,601	9/17/96	Harvey			
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